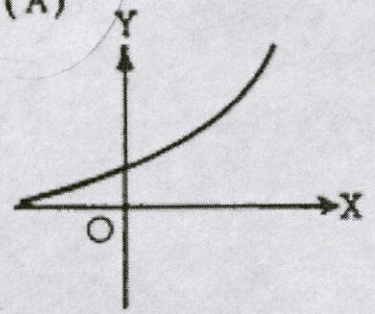
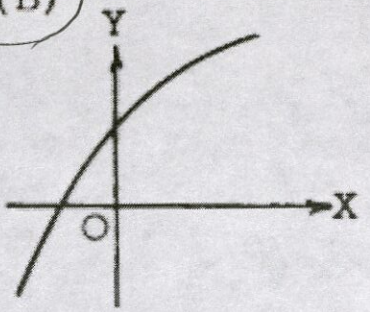
From: http://staff.4j.lane.edu/~windom/AP/ap%20multiple%20choice.pdf

. If y is a function of x such that $y' > 0$ for all x and $y'' < 0$ for all x, which of the following could be part of the graph of $y = f(x)$? (A)

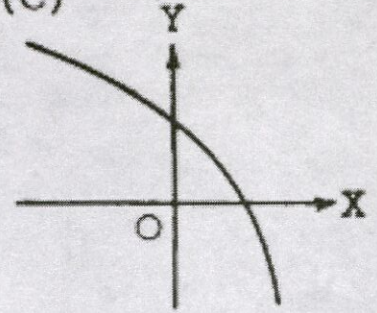
(A)



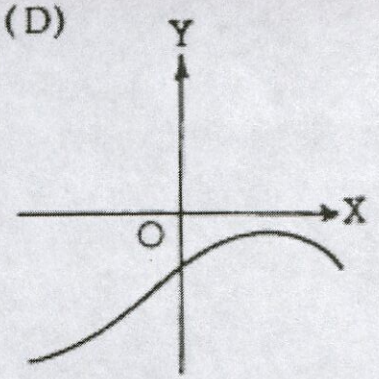
(B)



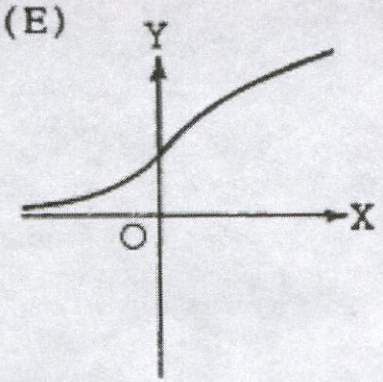
(C)



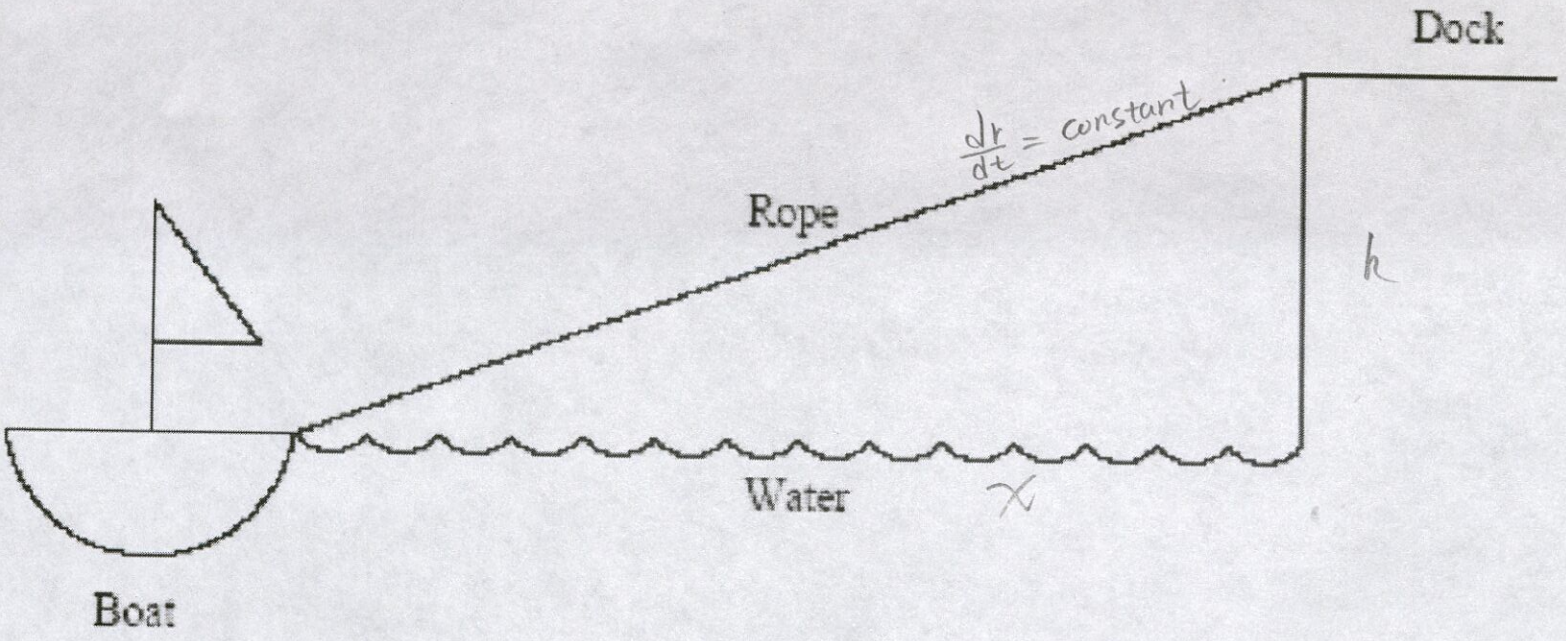
(D)



(E)



4.1.3 [P] A boat is drawn close to a dock by pulling in the rope at a constant rate. **True** or **False**. The closer the boat gets to the dock, the faster it is moving.



$\sqrt{x^2+h^2} = r$

$\frac{2x}{2\sqrt{x^2+h^2}} \frac{dx}{dt} = \frac{dr}{dt}$

$\Rightarrow \frac{dx}{dt} = \frac{dr}{dt} \cdot \frac{\sqrt{x^2+h^2}}{x}$ = constant $\cdot \sqrt{1+\frac{h}{x^2}}$

x gets smaller, $\frac{dx}{dt}$ gets bigger.

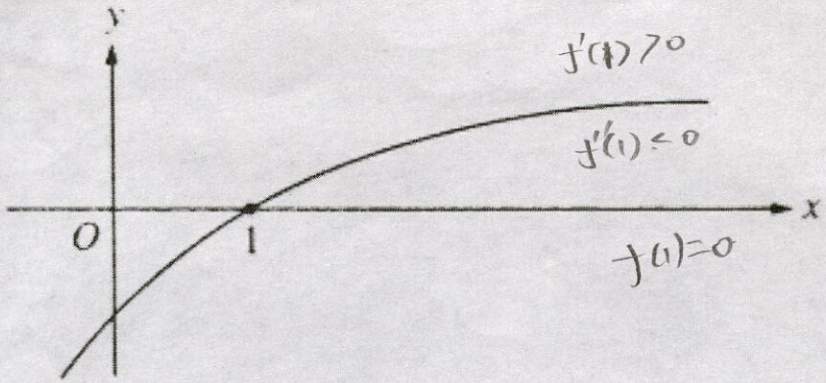
From: http://www.ilearnmath.net/help/index.php?page=apexamsmcgoodquestionscalculus

True or **False**. $\frac{d}{dx}\ln(\pi) = \frac{1}{\pi}$ (F)

4.2.1 [Q] **True** or **False**. If $f(x)$ is continuous on a closed interval, then it is enough to look at the points where $f'(x) = 0$ in order to find its absolute maxima and minima. Be prepared to justify your answer. (F) hint: check endpoints and where $f(x)$ DNE

4.3.3 [Q] If $f''(a) = 0$, then f has an inflection point at a. (F) the concavity should also change.

eg: $y = x^4$ at $x = 0$



17. The graph of a twice-differentiable function f is shown in the figure above. Which of the following is true?

(A) $f(1) < f'(1) < f''(1)$

(B) $f(1) < f''(1) < f'(1)$

(C) $f'(1) < f(1) < f''(1)$

(D) $f''(1) < f(1) < f'(1)$

(E) $f''(1) < f'(1) < f(1)$

17 is from 1998 AP Calc AB
http://staff.4j.lane.edu/~windom/AP/ap%20multiple%20choice.pdf

True/False

18.) If f is continuous, then f is differentiable. T F

19.) If f is differentiable, then f is continuous. T F

$lim_{x \to a} f(x) = f(a)$ if $f(a)$ is defined.

A) True **B)** False

If $y = f(t)$ represents the miles a car travels after t hours, then $f'(t)$ is the velocity of that car.

A) True **B)** False

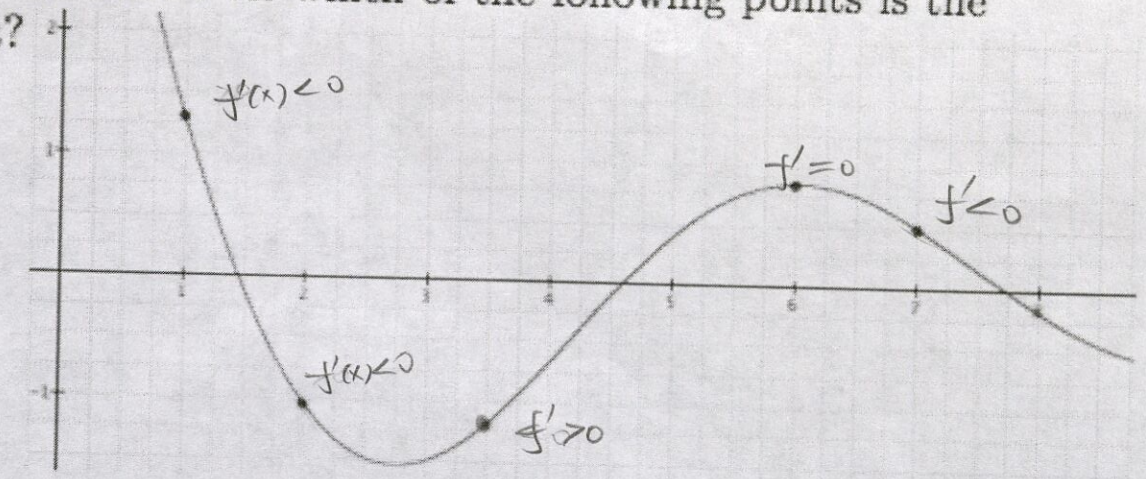
2.2.3 [P] You're trying to guess $\lim_{x \to 0} f(x)$. You plug in $x = 0.1, 0.01, 0.001, \ldots$ and get $f(x) = 0$ for all these values. In fact, you're told that for all $n = 1, 2, \ldots$, we have $f(1), f(\frac{1}{10^n}) = 0$.

True or **False**: Since the sequence 0.1, 0.01, 0.001, . . . goes to 0, we know $\lim_{x \to 0} f(x) = 0$.

F

from: http://www.brandeis.edu/registrar/newstudent/docs/placement/calculus_test.pdf

7. The graph of a function $f(x)$ is shown below. At which of the following points is the value of the derivative $f'(x)$ biggest?



(a) at $x = 1$
(b) at $x = 2$
(c) at $x = 3.5$
(d) at $x = 6$
(e) at $x = 7$

8. Consider again the function $f(x)$ whose graph is shown in problem 7. At which points is the second derivative $f''(x)$ negative?

(a) at $x = 2$ and $x = 3.5$
(b) at $x = 1$, $x = 2$ and $x = 3.5$
(c) at $x = 6$ only
(d) at $x = 7$ only
(e) at $x = 6$ and $x = 7$

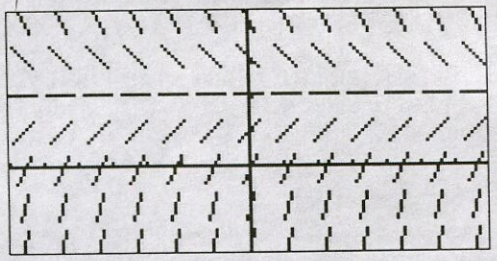
From: http://www.math.cornell.edu/~GoodQuestions/JittMapleTA.pdf

When we write $\lim_{x \to a} f(x) = \infty$ this means that the limit exists and is a really big number.

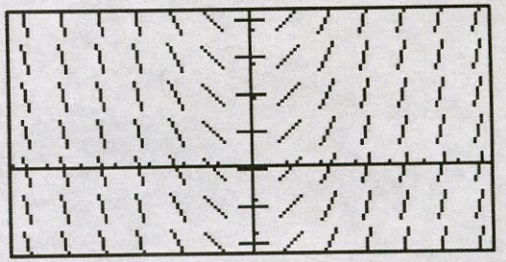
a.) True
b.) False

Match the slope fields with their differential equations.

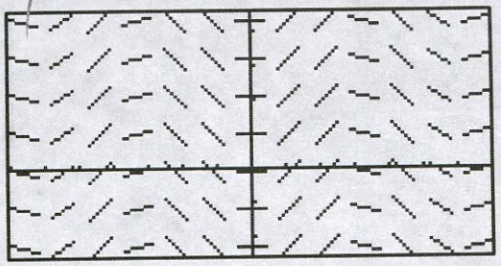
(A) 9



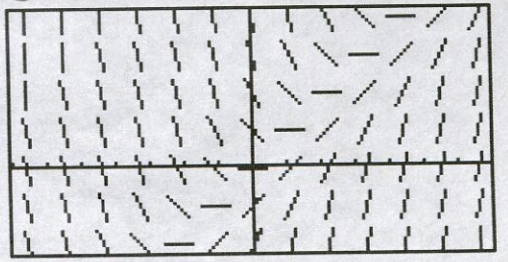
(B) 10



(C) 7



(D) 8



7. $\frac{dy}{dx} = \sin x$

8. $\frac{dy}{dx} = x - y$

9. $\frac{dy}{dx} = 2 - y$

10. $\frac{dy}{dx} = x$

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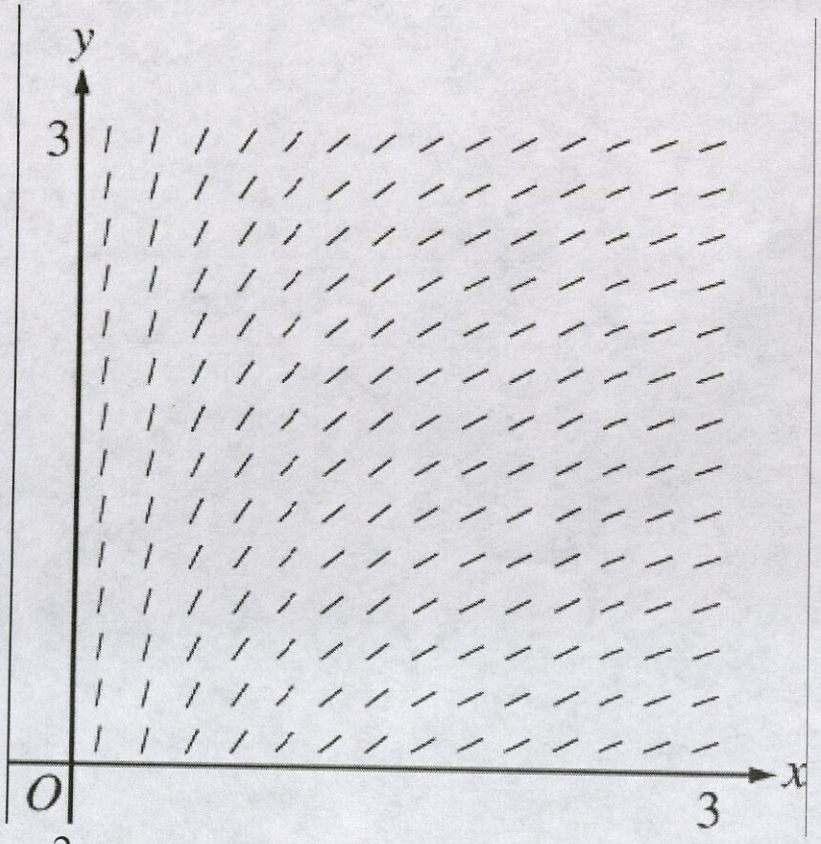
http://apcentral.collegeboard.com/apc/public/repository/ap08_calculus_slopefields_worksheet.pdf

From the May 2008 *AP Calculus Course Description:*
15.

From: http://
apcentral.collegeboard.com
/apc/public/repository/
ap08_calculus_slopefields_
worksheet.pdf



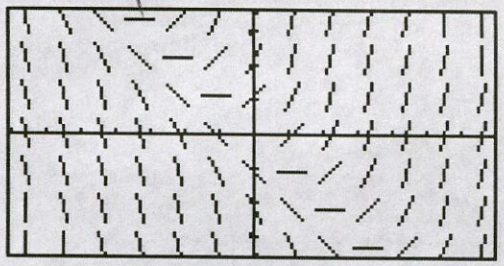
(A) $y = x^2$ (B) $y = e^x$ (C) $y = e^{-x}$ (D) $y = \cos x$ (E) $y = \ln x$

The slope field from a certain differential equation is shown above. Which of the following could be a specific solution to that differential equation?

(A) $y = x^2$ (B) $y = e^x$ (C) $y = e^{-x}$ (D) $y = \cos x$ (E) $y = \ln x$

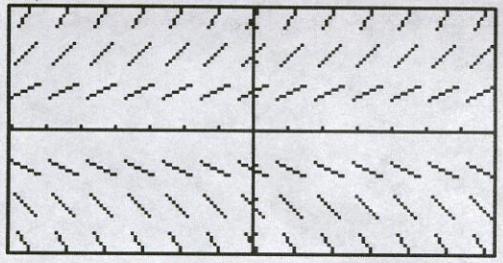
Match the slope fields with their differential equations.

(A) 14

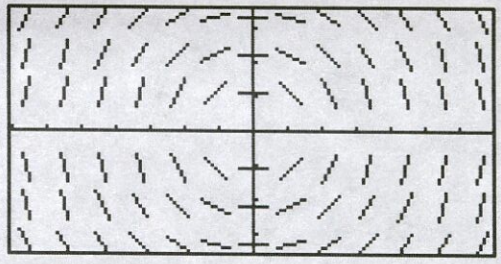


(B) 11

(C) 12



(D) 13



11. $\frac{dy}{dx} = 0.5x - 1$

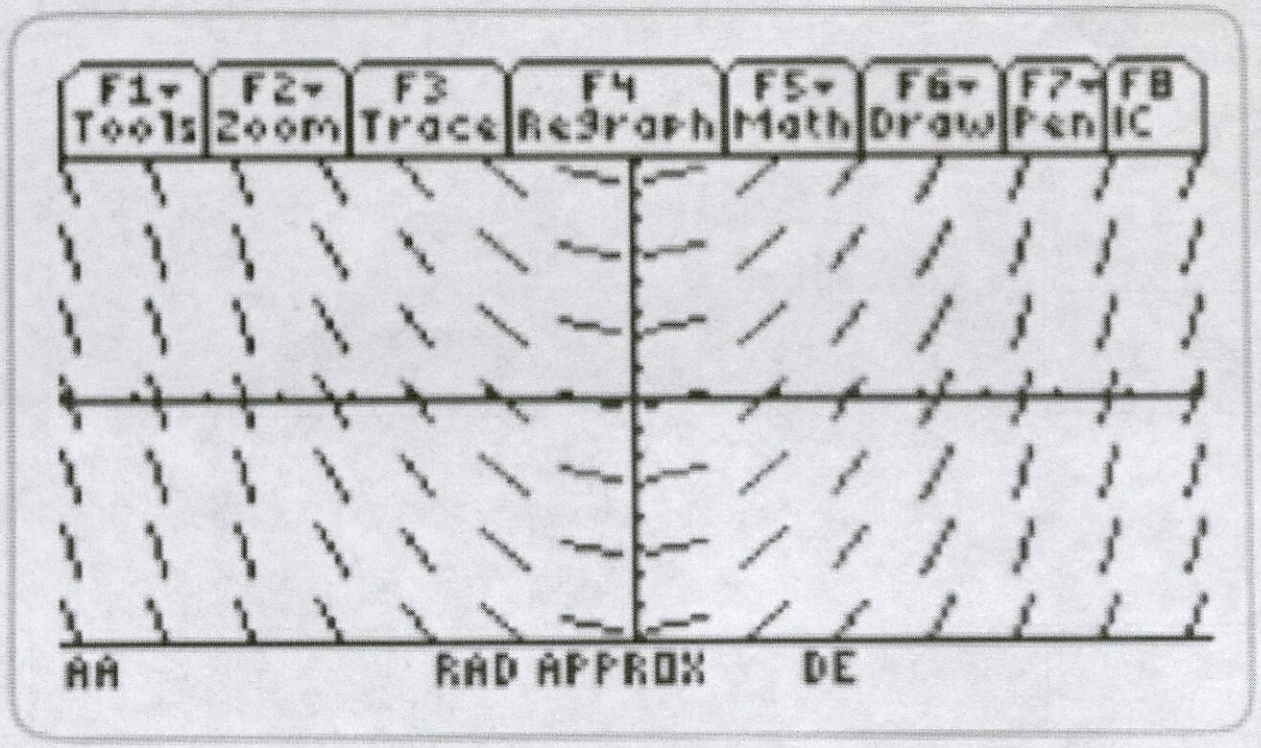
12. $\frac{dy}{dx} = 0.5y$

13. $\frac{dy}{dx} = -\frac{x}{y}$

14. $\frac{dy}{dx} = x + y$

http://apcentral.collegeboard.com/apc/public/repository/ap08_calculus_slopefields_worksheet.pdf

7. Which of the following could be a solution of the differential equation with the given slope field?



(A) $y = x + 1$

(B) $y = x^2 + 2$

(C) $y = x^3 - 2$

(D) $y = \ln(x + 1)$

(E) $y = 2e^x$

www.amscopub.com/%5Cimages%5Cfile%5CFile_8.jpg.pdf